Early Warning System For Detection Of Urban Pluvial Flooding Hazard Levels In An Ungauged Basin

Acosta Coll, Melisa Andrea; Ballester Merelo, Francisco Jose; Martínez Peiro, Marcos Antonio.

Abstract

Prolonged and high intensity rainfall often saturates urban drainage systems and generates urban pluvial flooding, resulting in hazardous flash floods. The city most affected by urban flooding in Colombia (South America) is Barranquilla since lacks a proper storm water drainage system. Heavy rainfall produces flash floods to quickly become torrential streams that flow down the streets endangering pedestrians. This research describes a low-cost early warning system (EWS) to detect in real time the hazard level of a stream in an ungauged basin. The EWS indicates whether it is safe or not for pedestrians to cross a flooded street, based on certain criteria used to assess the hazard level of the torrent. A hydrological and hydraulic model calculates the flow, velocity and water level in all cross sections along the stream. The model uses only real-time measurements of rain gauges and topographic survey data to determine the hazard level. Finally, a wireless sensor network sends the alert to a web platform and warns the community in real time.

Keywords

Early Warning System; Flash Floods; Hydraulic Model; Hydrological Model; Pluvial Flooding; Urban Drainage